

PRIMARY INFLAMMATION OF THE APPENDICES EPIPLOICAE*

WITH REVIEW OF THE LITERATURE AND REPORT
OF SIX ADDITIONAL CASES

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SINCE THE FIRST DESCRIPTION of appendices epiploicae some 400 years ago interest in them as sites of primary disease has recurred from time to time. Scattered individual cases have been reported in which they have been found free in the peritoneal cavity or in which some primary pathologic process has caused surgical intervention. Interest has been stimulated by the excellent reviews of Hunt,¹ Klingenstein,² Fiske³ and more recently by Pines,⁴ but recognition of primary disease of the appendices epiploicae is still rare.

Primary disease of the appendices epiploicae has attracted attention only by its rarity and this continues to be true in spite of the fact that it occurs more frequently than is implied by the infrequency of reports. We feel that it is timely to call attention to primary disease of the appendix epiploica and to present a review of the available literature, bringing the cases up to date and to add six additional cases. In this report we have gathered, and are presenting, only cases in which primary disease of the appendix epiploica have produced acute symptoms and signs which have warranted surgical exploration.

ANATOMY AND PHYSIOLOGY

The anatomy and function of appendices epiploicae should be mentioned. They have been shown to be present as early as the fifth fetal month. They occur along the large bowel except in the region of the rectum, and may have one to three rows though only one or two are usually demonstrated. They are definite fat tabs of irregular shape which are continuous with the subserosal fat layer and are enveloped by a layer of the visceral peritoneum from the large bowel. Their blood supply is gained from one artery and vein from either the superior or inferior mesenteric vessels.

The significance of these structures is obscure and their physiologic function has never been proven but the idea that they play a role in the absorption of fluids and as a protective mechanism for the colon seems justified. This latter may be in protection from other inflammatory processes or from adjacent viscera during peristalsis. Pines⁴ felt that appendices epiploicae acted as protective fat pockets for the redundant intestinal vessels and that this protective mechanism was obviously necessary to prevent collapse and occlusion of the vessels when the bowel became distended. It should be further added that in all probability they have a definite role in the storage of fat.

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PATHOLOGY

The etiology of primary disease within the appendices epiploicae has been discussed by many correspondents.^{2, 3, 5, 6, 7} The consensus of opinions is that torsion of the pedicle is usually the direct cause in spite of the fact that in many cases it cannot be demonstrated. It seems reasonable that it is the principal cause of interference of the blood supply, and is due to a variety of conditions, such as movement in adjacent coils of small bowel during vigorous peristalsis and the association of a large appendix epiploica with a long pedicle. Infarction may be present and has suggested, when torsion was not demonstrated, that it is due to thrombosis or embolism.^{4, 5} Payr⁸ thought that engorgement could be due to an abnormally long vein becoming twisted about the artery. Secondary changes which may occur include simple necrosis, various degenerative processes and gangrene. Why they should be the site of a primary inflammatory process has never been explained, though it is obvious when associated with other inflammatory lesions within the abdomen. Black⁹ was the first to suggest that they could be the site for developing lipomas.

ANALYSIS OF CASES PREVIOUSLY REPORTED

Fifty-eight cases have been previously reviewed or reported in the literature in which the symptoms and signs were of an acute or subacute abdominal disease and subsequently required surgery. This does not include cases which appeared to have had a chronic course over months or years, cases in which the appendices epiploicae were found in hernial sacs, noted at autopsy, cases associated with other inflammatory processes, or cases in which they were found incidentally at surgery for some other disease.

The site of the diseased appendix epiploca was on the sigmoid colon in 28 cases and on the cecum in 13 cases. The others occurred on various parts of the remaining colon. Torsion of the appendix epiploica was the most frequent diagnosis given, though in a majority of the cases the findings were not described. Thirty-six of the cases occurred in males and 22 in females. The ages ranged from 18 to 76 years with a majority (31 cases) occurring between 30 and 50 years. The symptoms and signs were incomplete in many cases; however, all cases had pain and it appears to be the only constant finding. In 46 cases tenderness was present and was most commonly seen overlying the diseased appendage. Nausea, vomiting or both occurred about as frequently as rigidity, that is, in about one-half of the cases. Rebound tenderness and a mass were only occasional findings.

REPORT OF ADDITIONAL CASES

Case 1.—A 40-year-old white male was admitted to the hospital with a history of gradual onset of lower abdominal pain 48 hours before which increased in severity and moved to right lower quadrant 24 hours prior to admission. He had a constant desire to defecate after onset. No nausea or vomiting was associated. He had had a previous similar attack 13 years ago lasting 24 hours. Examination revealed temperature of 98.6, WBC was 7,050. He exhibited moderate tenderness and well marked rigidity in right lower quadrant with no rebound tenderness. Preoperative diagnosis of acute appendicitis was made. At operation a large amount of bloody fluid was found and a gangrenous

appendix epiploica of the sigmoid measuring 6 x 4 cm. was present and removed. Post-operative course was uneventful.

Case 2.—A 47-year-old female was admitted to the hospital with a history of sudden gripping pain in the midline, above the symphysis for 12 hours previously. The pain "went through to the back." She had anorexia, but no nausea or vomiting. The pain moved to the lower left quadrant, back to midline and then to right lower quadrant. There was an urge to defecate with results. Examination revealed moderate tenderness over right lower quadrant with rebound tenderness to the same side. This tenderness shifted with position of the patient, from right lower quadrant to midline to left lower quadrant and back to right lower quadrant. Pelvic examination revealed tenderness in the right cul-de-sac. The temperature was 99.4, WBC 11,700. Preoperative diagnosis was acute appendicitis. At operation there was found a swollen blue appendix epiploica attached to the sigmoid, which was removed. Postoperative course was uneventful.

Case 3.—A 32-year-old female was admitted to the hospital with a history of fullness and discomfort in abdomen for 48 hours becoming painful and moving to right lower quadrant. This was not relieved by enemas or rest in bed as previous attacks had been. There was no nausea or vomiting. Moderately severe pain in right lower quadrant persisted. Examination revealed the temperature to be 99.0 and WBC 12,400. Moderate tenderness in right lower quadrant was present with no rebound tenderness and no masses. Preoperative diagnosis was acute appendicitis. At operation a blue gangrenous appendage was found in the pelvis which was attached to the sigmoid. It was removed and the postoperative course uneventful.

Case 4.—A 19-year-old white female entered the hospital for change of cast and further treatment for old fracture of right femur. While in the hospital she had onset of severe cramping abdominal pain which was followed by nausea and vomiting. Pain became more intense and was localized in the right lower quadrant with marked tenderness in same area. Temperature was 99.6 and WBC 14,100. Preoperative diagnosis was acute appendicitis. At operation the appendix was found to be normal and attached to cecum was an enlarged gangrenous appendix epiploica which was removed. The post-operative course was uneventful.

Case 5.—A 44-year-old male was admitted to the hospital with a history of slight epigastric pain and dysphagia of 72 hours duration, followed by severe right lower quadrant pain associated with nausea and vomiting. Examination revealed marked tenderness in the right lower quadrant. No masses were felt. The temperature was 100 and WBC 12,500. Preoperative diagnosis was acute appendicitis. At operation a dark gangrenous appendix epiploica measuring 5 x 0.8 cm. attached to the cecum was found. It was removed and postoperative course was uneventful.

Case 6.—A 34-year-old male was admitted to the hospital with a history of onset of abdominal pain 24 hours previously which had moved to the right lower quadrant and was noticed more when moving about. No nausea or vomiting was associated. He was admitted for a stat appendectomy. Examination revealed temperature of 98.6 and WBC 12,900. Marked tenderness in right lower quadrant was present with rebound tenderness. No masses were palpable. Preoperative diagnosis was acute appendicitis. At operation there was found an enlarged gangrenous appendix epiploica attached to the lower ascending colon. It was removed and postoperative course was uneventful.

DISCUSSION

In Baylor Hospital during the last 10-year period there have been six cases of primary disease of the appendices epiploicae producing symptoms sufficient

to cause surgical exploration. Within this same period of time it is of interest that surgery was done in 2766 cases for acute appendicitis. Also during this period primary disease of an appendix epiploica was found at time of surgery for some other disease process in four instances, yet no history could be obtained of any symptoms which they might have produced.

In the cases we are reporting symptoms were present for 48 hours or less except in one case of 72 hours duration. In four cases onset of pain was localized to the right lower quadrant. In others it was generalized or in the lower abdomen. Nausea and vomiting was present in three cases. In all cases tenderness was moderate to marked and localized to the right lower quadrant. Of considerable interest was the one case in which the tenderness was shifting in character. Rigidity and rebound tenderness was present in three cases each. Low grade temperature elevation was noted in three cases and an elevated WBC count was present in all except one. Torsion was not demonstrated in any of these cases.

We feel that we are justified in only presenting cases associated with symptoms of acute disease and which have required surgical intervention. Though torsion of the pedicle of the appendix epiploica is apparently the most likely cause of disorder, we were unable to show it in any of these cases. We feel that the sign of shifting tenderness should cause one to suspect the condition and want to stress again that in any acute surgical abdomen in which primary disease cannot be demonstrated elsewhere one should explore thoroughly for the presence of a diseased appendix epiploica.

It is quite apparent that pathologic changes may occur in the appendices epiploicae without producing symptoms and this most likely accounts for those found incidentally at other operations and at autopsy. It is just as apparent that in many instances these do produce symptoms and signs of an acute abdominal disease and in such cases surgical exploration is indicated.

SUMMARY

The available literature has been reviewed and the cases of primary disease of the appendix epiploica unassociated with other conditions or which were found incidentally, have been collected and brought up to date. To this number we are adding six cases in which the primary disease justified surgery. We have suggested that shifting tenderness should cause one to suspect the disease, and in all cases of acute abdomens in which a primary disease is not found one should look for a diseased appendix epiploica.

BIBLIOGRAPHY

- ¹ Hunt, V. C.: Torsion of Appendices Epiploicae. *Ann. Surg.*, **69**: 31, 1919.
- ² Klingenstein, P.: Some Phases of the Pathology of the Appendices Epiploicae With a Report of 4 Cases and a Review of the Literature. *Surg., Gynec. & Obst.*, **38**: 376, 1924.
- ³ Fiske, F. A.: Intra-abdominal Torsion of Appendices Epiploicae: Report of 2 Cases. *Am. J. Med. Sc.*, **192**: 354, 1936.
- ⁴ Pines, B., J. Rabinovitch and S. B. Biller: Primary Torsion and Infarction of the Appendices Epiploicae. *Arch. Surg.*, **42**: 775, 1941.

- ⁵ Griffin, H. M., E. P. McManamy and J. M. Waugh: Surgical Significance of the Epiploic Appendages. *Arch. Surg.*, **45**: 351, 1942.
- ⁶ Moore, G. A.: Appendices Epiploicae. *New England J. Med.*, **222**: 919, 1940.
- ⁷ Milroy, P.: The Surgical Affections of the Appendices Epiploicae. *Brit. J. Surg.*, **29**: 438, 1942.
- ⁸ Payr, E., quoted by Moore, G. A.
- ⁹ Black, S. O.: Torsion of Appendices Epiploicae, with Report of a Case. *South. Med. J.*, **16**: 35, 1923.
- ¹⁰ Porter, S. D.: Torsion of Appendices Epiploicae; Report of a Case. *J. Iowa St. Med. Soc.*, **33**: 223, 1943.
- ¹¹ Kirkham, J. H., and I. Zerlin: Quoted in *Yearbook of General Surgery*. Chicago, Yearbook Publishers, 1944.
- ¹² Byberg, R. A., and C. R. Lam: Epiploic Appendicitis: A Cause of Left-Sided Abdominal Pain. *Ann. Surg.*, **122**: 127, 1945.
- ¹³ Ives, H. R.: Gangrenous Appendices Epiploicae; *U. S. Naval Med. Bull.*, **46**: 1889, 1946.

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